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ARMY INFORMATION DIGEST

OFFICIAL MONTHLY MAGAZINE of the DEPARTMENT OF THE ARMY

The mission of ARMY INFORMA-TION DIGEST is to keep personnel of the Army aware of trends and developments of professional concern.

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PLANNING precedes action in every phase of Army operations. On the tactical level, sketches. maps, sand tables, even scale models help troops visualize their objectives, as in the front cover scene where infantrymen on maneuvers in northern Bavaria get a briefing before assault on "Mock City." For Stateside units, a variety of ready-made training aids are available through the Army's nation-wide Training Aids Center System whose workings are described in "From Show-How to Know-How," this issue.

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In This Issue:

Our Reserve Forces by Lt. Gen. Ridgely Gaither The new Deputy Commanding General for Reserve Forces, CONARC, emphasizes the vital role of reserves in maintaining our national security.			4
From Show-How to Know-How, by Col. H. A. N. Connolly By mail order and over the counter, the Army Training Aids Center System provides ready-made devices to improve training effectiveness.			8
Streamlining Personnel Record Keeping by Col. Melvin M. Marking a giant stride in managerial efficiency, The Adjutant General's Office plans to process data with electronic speed, using the latest computing machines.	Kerna	in :	14
Hardware for Combat by Col. Frank C. Paul Communications, electronic and airborne equipment for the Army of the future must pass rigorous serviceability tests at CONARC Board No. 5.			19
Farthest North Airdrop by Lt. Col. Stephen J. Meade In the largest tactical drop ever staged north of the Arctic Circle, 82d Airborne troopers demonstrate their combat capability under the toughest possible conditions.		. 2	24
Regular Officer Augmentation Act by Lt. Col. Ernest A. H. Woodman and Maj. E. D. Bryson Army implementation of Public Law 737 will insure long-range improvement in the Regular Army officer structure.			3]
Preserving Food by Radiation by Col. William D. Jackson The Army pioneers in a new scientific development which may revolutionize the logistics of battlefield supply.		. (38
Cold Sterilization of Foods by Sgt. Merrill S. Read and Dr. H. F. Kraybill Problems in nuclear physics, food chemistry and medicine are under study by Army scientists to insure healthful preservation of food by irradiation.		. 4	1(
In Brief			
Versatile Airborne Radio 18 Army Anniversaries Reserve Retirement 37 Mechanical Mule	. 45		
What's New in Training		. 4	14
Paragraphs from the Pentagon and the Field		. 4	16



OUR RES

LT. GEN. RIDGELY GAITHER

Deputy Commanding General

for Reserve Forces,

Continental Army Command

DURING this era of cold war and international tension, when our Army must be prepared for the contingencies of conventional warfare or all-out atomic holocaust, the requirements of our national security make it imperative that the Nation have powerful, organized reserve forces—trained, equipped and strong enough to meet any emergency.

The enactment of the Reserve Forces Act of 1955 (Public Law 305—84th Congress) marked an important advance toward this goal. Since then, the Army has moved ahead vigorously to realize every possible benefit from the Act. Although the initial input under the Reserve Forces Act has not gone as fast as some optimistic estimates, the program is now gaining momentum as those who have received Army training return home to influence others.

"The future of the Army Reserve," Secretary of the Army Wilber Brucker recently pointed out, "depends upon what we do with this splendid manpower. Will these well-trained young men find a dynamic program in their hometown units? Will they find a program which will sustain their enthusiasm, and result in the development of a truly combat ready organization? We must make sure that they do. . . ."

TAKING cognizance of the vital

LIEUTENANT GENERAL RIDGELY GAITHER, Deputy Commanding General for Reserve Forces, CONARC, prior to his present assignment was Assistant Chief of Staff for Intelligence, Department of the Army. Previously he commanded the 11th Airborne Division at Fort Campbell, Kentucky; the 40th Infantry Division in Korea; and the XVIII Airborne Corps at Fort Bragg, North Carolina.

ESERVE FORCES

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"The Congress hereby declares that the reserve components of the Armed Forces of the United States are maintained for the purpose of providing trained units and qualified individuals to be available for active duty in the Armed Forces of the United States in time of war or national emergency and at such other times as the national security may require to meet the requirements of the Armed Forces of the United States in excess of those of the Regular components thereof during and after the period needed for procurement and training of additional trained units and qualified individuals to achieve the planned mobilization."

Mission of the reserve components, as stated in the Armed Forces Reserve Act of 1952 (Public Law 476—82d Congress)

importance of the Army's expanding reserve components, the Army on 27 July created an entirely new post at Headquarters, Continental Army Command—the post of Deputy Commanding General for Reserve Forces. This action forges still another link in the chain of events designed to further improve the posture of the Army to successfully accomplish its missions.

Before the functions of the new office can be clearly delineated and the problem areas specifically identified, the area to be covered by the new job—including the complexities of the structure of the National Guard, the Army Reserve and the Reserve Officers Training Corps—must be clearly understood. Indeed, any reference to the capability of the Army to successfully accomplish its missions must include consideration of these reserve components.

NATIONAL GUARD

THE National Guard is the product of an evolutionary chain which extends back to the Nation's frontier days. The Guard has the longest continuous history of any military organization in the United States and is, in fact, older than our Nation.

The importance of a powerful reserve is not new, although developments in recent years have served to reemphasize the fact. In 1783, General George Washington wrote that "It may be laid down as a primary position, and the basis of our system, that every Citizen who enjoys the protection of a free Government, owes not only a proportion of his property, but even his personal services to the defense of it, and consequently that the citizens of America (with a few legal and official exceptions) from

15 to 60 years of age should be borne on the Militia Rolls, provided with uniform and arms, and so far accustomed to the use of them that the total strength of the Country might be called forth at Short Notice."

Due to the realization that a Militia was necessary, provisions were incorporated into our Constitution for organizing, arming and training of the Militia. From this legal beginning, the Militia, and its present counterpart, the Na-

tional Guard, evolved.

Through the years there has been an increasing effort on the part of the government to provide adequately for a reserve force of sufficient size and composition. During the period between 1792 and 1903, very little support for the Militia was provided by the Federal Government. However, in 1903 and again in 1908 the Federal Government began to expand such support for the Militia, and provisions were made for the detailing of officers of the active Army as Inspector-Instructors.

THE next link to be forged in the chain was the passage of the National Defense Act of 1916. This Act prescribed that the National Guard of the several States was a component of the Army of the United States when in the active military service of the United In 1933, amendments to the National Defense Act of that year created a new force, the National Guard of the United States, designated as a reserve component of the Army.

Actually, this new force was not a separate one. The term "National Guard" referred to the National Guard of the several States in their State status. The term "National Guard of the United States" referred to the same units and individuals but referred to them in their Federal status as re-

serves of the Army.

It was not until June 1920 that a troop basis for the National Guard was developed. Although a troop basis of 464,000, including 18 divisions, was initially established, budgetary limitations subsequently reduced this figure in practice to 190,000. This ceiling of 190,000 was maintained until 1940, at which time the National Guard was authorized to recruit to 200,000 and then to 300,000. When mobilized for World War II, the National Guard supplied 300,024 men, organized into 18 divisions and supporting units.

After World War II, the Army National Guard started rebuilding, and by December 1949 had organized, and had Federally recognized, 4,436 units with an aggregate strength of some 355,000 of an authorized troop basis of 5,297 units with a strength of 620,000, During the Korean emergency, the Guard was again called to the colors and about one-third of that component, including 8 divisions, were

mobilized.

FOLLOWING the Korean emergency, the Army National Guard again had to initiate a rapid rebuilding program. Its strength is now the highest in its history. There are 5.726 units in the troop basis, 5,598 have been allotted to the several States, and 5,366 have been Federally recognized. These Federally recognized units are currently organized into 21 Infantry Divisions, 6 Armored Divisions, 13 Regimental Combat Teams, 9 Armored Cavalry Regiments, 5 Corps Artillery Headquarters, 12 AAA Brigade Headquarters and 74 Group Headquarters and 264 battalions of various types, plus other smaller size units.

To minimize difficulties inherent in mobilization and training of the Army National Guard, and to facilitate subsequent deployment of National Guard units at the earliest practicable date, Guard units are now organized under the same Tables of Organization and Equipment, and use the same training programs, as the active Army. This has been a comparatively recent concept developed to avoid the pitfalls and problems which have occurred in the past. Thus a closer integration of the National Guard and the active Army is assured, consistent with the basic policy of the United States, as reaffirmed by the Congress in 1952, that "The Congress further declares in accordance with our traditional military policy as expressed in the National Defense Act of 1916 as amended, that it is essential that the strength and organization of the National Guard . . . as an integral part of the first line of defense of this Nation be at all times maintained and assured."

ARMY RESERVE

THE Army Reserve, as it is known today, had its origin in the Act of 12 August 1912. At that time, two classes of reservists were established—those enlisted men of the active Army who were furloughed to the reserve after four years of active duty (or three years at the discretion of the Secretary

of War), and honorably discharged men who voluntarily enlisted in the reserved.

Establishment of an Officers Reserve Corps (ORC) and an Enlisted Reserve Corps (ERC) was provided for by the National Defense Act of 1916. The ORC, designed "for the purpose of providing a reserve of officers available for military service when needed," was open to certain civilians and provided for commissions in the various branches. The ERC was designed to provide immediately on mobilization a larger number of specialists than was required in the peacetime Army in the Engineer, Signal, Quartermaster, Ordnance and Medical branches.

During World War I, all members of the Officers Reserve Corps were transferred to the active Army, as were members of the Enlisted Reserve Corps. No further enlistments in the ERC were accepted after World War I, and it ceased to exist until 1920.

The National Defense Act of 1920 created the Organized Reserve Corps, consisting of the Officers Reserve Corps and the Enlisted Reserve Corps. This organization of what is now known as the Army Reserve remained essentially unchanged until after World War II.

By July 1952, the Organized Reserve Corps had been redesignated as the Army Reserve and the troop basis provided for the organization of units in this element as well as in the National Guard. Today the troop basis of the Army Reserve provides for some 7,200 units, of which 5,289 have been organized. The troop basis provides for 10 Infantry Divisions, 3 Maneuver Area

Commands, 12 Replacement Training Commands, 2 Corps Artillery Headquarters, 2 AAA and 7 Engineer Brigade Headquarters, 9 Logistical Commands, and 136 Group Headquarters and 525 battalions of various types, plus other smaller size units.

ROTO

IN addition to the two reserve components of the Army—the National Guard and the Army Reserve —a vital function is being accomplished by the Reserve Officers

Training Corps.

The Congress initially provided for the establishment and maintenance of the ROTC in the National Defense Act of 1916. Since then, the ROTC has been one of the principal officer procurement sources for the active Army and the reserve components. The program started in the fall of 1916 with about 40,000 students. From 1920 until suspended in 1943, some 159,000 officers came from ROTC.

The ROTC program has since expanded until today the program is being conducted in some 260 colleges or universities and at 370 secondary schools. Total enrollment is about 200,000; some 15,000 students will be commissioned from the senior division after graduation from college each year. Through the Distinguished Military Graduate Program, the ROTC is furnishing approximately one-half of all junior officers commissioned in the Regular Army.

SUPERVISORY ORGANIZATION

SINCE the days of the Founding Fathers, despite difficulties of many and varied kinds, this Nation has increasingly emphasized the importance of, and support for, our reserve forces. Today in conjunction with the efforts being expended by the reserves themselves, a dynamic effort is being applied by the active Army to further strengthen our reserves.

A program of such magnitude, representing every field of military endeavor, requires close and continuing supervision by all interested agencies to insure that desired goals are attained as rapidly and as efficiently as possible.

Secretary of the Army Brucker has repeatedly pointed out, as has our Chief of Staff, General Maxwell D. Taylor, that one of the most important and most urgent tasks of the Army is the development of an adequate and well trained Reserve Force.

To insure that the program received appropriate attention at the Department of the Army level, an Assistant Secretary of the Army has been specifically designated for Manpower and Reserve Forces and devotes an appreciable part of his time to the latter function.

In addition to the Department of the Army directorate, two special staff sections are totally involved in reserve forces activities—namely, the Office of the Chief, Army Reserve and ROTC Affairs, and the National Guard Bureau. In further recognition of the importance of the Army reserve components, a Special Assistant to the Chief of Staff for Reserve Components has been designated.

ONE of the principal functions of Headquarters, Continental Army Command (formerly Office, Chief of Army Field Forces) pertains to the Reserve Forces. The Commanding General, Continental Army Command is responsible to the Chief of Staff of the Army for the supervision of training of the Army Reserve; establishing training criteria for, and inspecting and supervision of training of, the Army National Guard; and for the direction, supervision, coordination and inspection of all matters pertaining to the organization and training of the ROTC.

To assist the Commanding General, Continental Army Command in discharging his Reserve Forces responsibilities, and to give further emphasis to this important mission, a Deputy Commanding General for Reserve Forces, CONARC has been established. As the first occupant of this new position, I am looking forward with enthusiasm to meeting the challenge inherent in this

assignment.

THE basic mission of the reserve components of the Army, as stated in the foreword to this article, must be accomplished. As the alter-ego of the Commanding General, Continental Army Command in all matters pertaining to the Reserve Forces, my initial duties have consisted of visiting the six Army Areas to determine what is being done and what still must be done to accomplish our objective. This procedure will continue to be followed, so that the innumerable problems which arise in reserve training not only may receive a sympathetic hearing, but shall be carried forward to a practical solution.

I especially appreciate the efforts being made by interested agencies and individuals to resolve the problems currently limiting the ability of the reserve components to attain required goals. My efforts will be devoted to assisting in the resolution of those problems.

All efforts necessary to attain our goals will be taken. Any actions required of agencies other than the Continental Army Command will be strongly represented to those agencies.

THE vital contribution to be made by the reserve unit commander, too, cannot be minimized—or over-emphasized. As Secretary Brucker has stated, "The ultimate effectiveness of our Reserve will be determined largely by how well unit commanders do their jobs. They must provide practical, realistic and progressive training for their units comparable to the training received in the active Army."

Provision of adequate equipment, armories, annual field training and weekend training sites, training time and school support will not automatically guarantee results. The reserve unit commander must use all of his tools.

In the discharge of my new duties in planning, inspection and active supervision of the entire Army Reserve structure, my field of operations will cover the entire United States and its territories. In every aspect of operations, I will be guided by the expressed policy of General Willard G. Wyman, Commanding General, Continental Army Command, to the effect that "The importance of continuing to give top priority and maximum effort to insure the success of our reserve program cannot be emphasized too strongly."

FROM SHOW-HOW TO KNOW-HOW

Colonel H. A. N. Connolly

A NEWLY published, official pamphlet written at Head-quarters, Continental Army Command promises to be one of the best-thumbed volumes on the orderly room shelf. Known as DA Pamphlet 310–5, it is the first index of all approved Department of the Army graphic training aids, transparencies and devices available through the 23 subcenters of the Training Aids Center System.

This "mail order catalog" brings to the instructor, whether at squad or division level, a wide variety of educational aids including mockups, flip-charts, working models, miniatures and trainers.

It is the latest move toward the continuing objective of the Training Literature and Aids Branch, G-3, Continental Army Command, to make training aids easily and quickly available to the training officer of whatever component—Active, Reserve, National Guard or ROTC—wherever located in the Z1 Army Areas.

The Army training aids program

in itself is simply an extension of the old truism, "seeing is believing." Military instructors have long known that a lesson learned through two or more of the senses is a lesson absorbed. Large groups can be trained more quickly with a higher rate of retention when they use their ears, their eyes, their sense of touch—sometimes even the sense of smell.

The Army's first venture into standardized visual education came with the Signal Corps training film, used during and since World Wars I and II to augment the classroom lecture. Distribution through the Film and Equipment Exchanges proved a speedy and well-organized method of supplying various units. (See "Army Pictorial Service Division," April–May 1956 Digest.)

However, charts, mockups, terrain tables and other aids that fell in the category of graphics or devices, were left to the ingenuity of the training units. They were good or mediocre, according to the talent that had produced them; at best, they were expedients.

THIS haphazard method came to an end in 1950 when the present Training Aids Center System was

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established. The best talent the Army could command went into the design of graphics and devices, which were channeled to the units through centralized procurement, production and distribution.

Training aids centers were set up at each Army headquarters to administer the work of 23 subcenters located at principal installations. Under the system that prevails today, the subcenters manufacture, reproduce and maintain a supply of stock training aids which are

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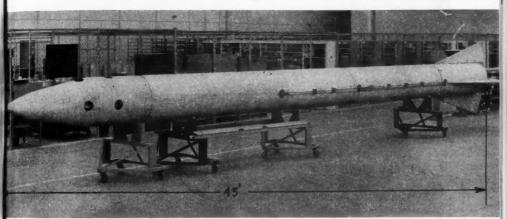
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hours of labor is involved.

Common sense dictates that the subcenters operate near and in conjunction with the area film exchange. Training films, essential to the visual education program, are used to supplement graphics—i.e., charts, slides, transparencies—and devices. The latter are three-dimensional models, demonstrators or trainers, the more ambitious of which are produced by the Army Participation Group at the Navy Special Devices Center in Long



An actual scale model 45 feet long enables students to develop a working knowledge of the various parts of a Corporal missile.

furnished to units on a loan basis. (See "Training Aids for the Asking," April 1952 DIGEST.)

IN MOST respects, the subcenters parallel the highly successful Film and Equipment Exchanges. They carry substantial stocks of those training aids approved for Army-wide use and they deal directly with the using unit. However, the subcenters also design and produce additional aids to meet special needs of local training officers, provided the cost is less than \$225 or less than 125 man-

Island, New York. (See "Training Devices for Combat Realism," May 1952 DIGEST.)

Training films have long been available for issue as listed in DA Pamphlet 108–1, but until the new DA Pamphlet 310–5 was compiled the training officer had no convenient reference to graphics and devices. Now the training officer, lesson plan at hand, can use the two pamphlets to select needed aids before going to the subcenter and exchange. Or he can simply order by mail.

Assume that the officer's training



Huge reproductions can be seen from all parts of a classroom as the instructor demonstrates workings of a compass.

project is the M1 rifle, that he wishes to use standard aids and have them mailed. Under "Rifle, M1" in the new pamphlet, he finds a listing of appropriate graphic training aids.

ONE, a series of 30 by 40 flipover charts in full color, shows all the operating parts of the weapon in the proper positions during each step in the firing cycle. This graphic is described as suitable for instructing units up to a platoon in size and can be used either indoors or out. (The same charts, it is noted, are available as transparencies for use with an overhead projector before larger groups.)

Also available is a disassembly mat—a large plastic chart with the operating parts stenciled in silhouette. This is recommended for groups of six or less, since such a chart must be placed flat on a table so the disassembled parts can be laid in their proper places.

Another device of interest is an

operating model of the weapon, done two-to-one scale, complete with dummy rounds. One side is cut away so the parts can be observed when the model is loaded and "fired."

In the film catalog, the training officer finds a variety of additional items—a filmstrip on disassembly, one on inspection of the rifle, others on maintenance and repair; a film bulletin on infantry weapons and their effects; and two training films—one on the principles of automatic and semi-automatic weapons, one on the principles of operation of .30 caliber weapons.

THE training officer then decides, on the basis of the number of men he must train in a given time, which of these is most appropriate.

He turns his list over to the company commander who follows a simple routine designed to speed the training aids to the unit. The films are ordered from the nearest exchange; the graphics and the device from the nearest subcenter. The standard issue slip (Form 446) is used.

Within 24 hours after receiving the request, the subcenter has the training aids on the way, shipping costs prepaid. Items are normally on loan for 30 days, although extensions can be arranged.

Conceivably, the device or graphic which the training officer ordered may have been drawn up originally by a fellow training officer for his own use in the field. Its success may have prompted him to recommend it to CONARC for Army-wide use.

A combat formation board soon to be standardized, for instance, was made by a training officer under such circumstances. The original, made of canvas, had eighteen movable plaques representing men and seven plaques representing squads or platoons. After testing the idea and finding it acceptable, the CONARC Training Literature & Aids Branch had produced a far

TRAINING AIDS SUBCENTERS and their areas of responsibility

Training Aids Centers at each Army Headquarters administer Subcenters at the following locations:

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FIRST ARMY AREA

Serving Units in

Ft Devens, Mass. Ft Dix, N. J.

Massachusetts, Rhode Island, Maine, New Hampshire, Vermont, Connecticut New York, New Jersey

Northern half of Mississippi, northern half of Alabama

Southern half of Mississippi, southern half of Alabama, northwest Florida, southwest Georgia

Michigan, Indiana, Illinois, Wisconsin, Minnesota, North Dakota, South Dakota

SECOND ARMY AREA

Ft George G. Meade, Md.

Ft Lee, Va.

Ft Knox, Ky.

Maryland, Delaware, Pennsylvania

Kentucky, Ohio, West Virginia

THIRD ARMY AREA North Carolina

Ft Bragg, N. C.

Ft Campbell, Ky

Ft McClellan, Ala.

Ft Rucker, Ala.

Ft Benning, Ga.

Ft Stewart, Ga.

Ft Jackson, S. C.

Ft Chaffee, Ark.

Ft Polk, La.

Ft Sill, Okla.

Ft Hood, Tex. Ft Bliss, Tex.

South Carolina FOURTH ARMY AREA

Arkansas Louisiana

Tennesse

Oklahoma

Texas (except extreme southwest)

Southwest Texas, New Mexico

North and central Georgia

Southeast Georgia, southern Florida

FIFTH ARMY AREA

Cp McCoy, Wis.

Ft Leonard Wood, Mo.

Ft Riley, Kans.

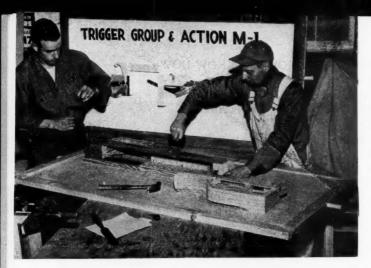
Ft Carson, Colo.

Iowa, Missouri Kansas, Nebraska Colorado, Wyoming

SIXTH ARMY AREA

Ft Lewis, Wash. Ft Ord, Calif.

Washington, Oregon, Idaho, Montana California, Nevada, Utah, Arizona



Skilled workmen carefully reproduce, on a large scale, a wooden working model of the M1 rifle trigger mechanism.

Dummy machinegun shells, three times actual size, are reproduced in low cost plastic. In background are cutaway models of various weapons.





Training devices for local use may be made at Training Aids Subcenters. Here a workman prepares an aid for use in mortar training.

more sturdy combat board made of galvanized wire mesh screening in a sturdy plywood panel which can be mounted on a stand. The movable pieces are stored in a compartment provided at the back of the training aid.

Moreover, it was found that the original board could be used not only to teach combat formations but to illustrate techniques of squad fire and how to set up layouts for mine fields. Thus a field-born training aid, tested, improved, and bearing Department of the Army approval, will be returned to the field for Army-wide use.

NEW equipment and weapons, of course, generate a host of new training aids. As an example, an inexpensive simulated atomic fire marker for use in exercises and maneuvers has been a very real need of the Army for years.

This requirement is being met by a new training device worked out through CONARC channels and now being standardized for Army-wide use. It consists of five smokepots which can be hauled in a jeep, carried by hand to the desired position and exploded.

Nike has added training boosters, warheads and propellants to the list of Army devices. In addition, fifty charts and one hundred transparencies are being reviewed at Fort Bliss, Texas, training center for Nike crews, to determine which should be adopted for on-site training use.

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As for the *Corporal*, a one-to-one replica of this missile is in the making. Forty-five feet long, it will be used to train crews in handling the missile.

As with guided missiles, new hardware and doctrine dictate changes. Sometimes new tactical uses for established equipment add to the catalog. As an example, increased emphasis on the Army's organic aviation and the expanded aviation training program has been reflected in requirements for a new series of graphics and devices—flight simulators, trainers, and demonstrators.

Developments in training techniques make their contribution too. As a result of current rifle marksmanship studies, some seventeen new targets and target systems are under study to speed training.

WHEN the field outlines a requirement for a new training aid, CONARC turns the project over for development to the responsible agency or agencies, according to primary interest. In preparing *Nike* training aids, for example, almost anything having to do with mechanized techniques of the weapon goes to the Ordnance Corps; electronics system aids are produced by the Signal Corps; elevators are the responsibility of the Corps of Engineers. However, The Antiaircraft Artillery and Guided Missile Center at Fort Bliss provides charts or devices for training in its use.

Whether concerned with the old or the new, with the whole wide range of subject matter from leadership to missile-handling, the Training Aids Center System has one simple objective—to help Army instructors in all components to make the United States soldier the best-trained, best-performing soldier in the world—and all this in the shortest possible length of time.

Streamlining

Personnel Record Keeping

Colonel Melvin M. Kernan

MILES OF magnetic tape packed with records of Army personnel and processed at fantastic speeds by means of electronic data processing equipment, will provide The Adjutant General's Office with exact data on such management questions as—

recruitments effected in a given time—

 spread of MOS's by branch, grade and command—

 reports on accessions and losses over a given time—

 eligibility lists for promotion consideration by Selection Boards.

These and numerous other matters affecting the accuracy and efficiency of personnel management in the Army are now susceptible to rapid compilation and comparison through the modern wizardry of electronic computers.

UNDER a program recently authorized, the Adjutant General's Office expects to have in operation a centralized Automatic Data Proc-

COLONEL MELVIN M. KERNAN, Adjutant General's Corps, is Chief, Statistical and Accounting Branch, Administrative Services Division, Office of The Adjutant General, Department of the Army.

essing System (ADPS), employing such an electronic computer, by the end of this calendar year.

To the Adjutant General's Office—so vitally concerned with accurately maintaining a tremendous volume of records and reports—the program is expected to result in greater accuracy, more speed, efficiency and considerably reduced costs in administering the Army Personnel Accounting System.

To units in the field—particularly Machine Records Units—it is expected to mean a reduced work load.

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To the individual in the Army it presents the prospect of fewer mistakes in maintaining records, speedier decisions in many personnel actions, more efficiency in assignments. For citizens and taxpayers, it means reduced costs in Army administration.

INTRODUCTION of a central Automatic Data Processing System in the Adjutant General's Office will not materially alter the present system of records compilation. Machine Record Units (MRU) in the field would continue to feed in source data on personnel, strengths

and equipment as now is being done through a world-wide accounting network. (See "How the Army Knows Its Strength," July 1948 DICEST.)

In place of summary information being forwarded from the field MRU's, individual changes would be reported from oversea theaters and ZI Army headquarters over transceivers which actually duplicate punched cards via telephone or teletype lines or radio circuits.

All of this information (some of which is now maintained on punched card files at Department of the Army level) would be recorded on magnetic tape. Each officer and enlisted man would have a record of several hundred information items similar to that now shown on the Officer's DA Form 66 and the Enlisted Man's DA Form 20. A single inch of magnetic tape can record 200 alphabetic or numeric characters of information.

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Such a tape can be fed into the computer at the rate of 2,400 feet in 6.4 seconds. Management savings will result from the speed by which computations and comparisons can be made in the central computer. These speeds are measured in microseconds (millionths of a second).

Once a master magnetic tape file is set up—and is updated daily—the flexibility of the system is such that output devices can be used simultaneously to record and print various report requirements in tabulated form by a single passage of the tape through the central computer.

By centralizing records on one master tape file, other files can be eliminated, principally those for officer personnel which already have been centralized to meet personnel management needs. These would include, for example, the present punched card files containing details on officer qualifications, those recording the linguistic ability of Army personnel, others for computing annual efficiency ratings, and promotion and retirement files. Thus substantial savings in personnel and equipment should result.

BUT perhaps even more significant than the savings aspect are the additional aids to management. Specific advantages that can be expected include an increase in both the *quality* and *quantity* of data that is maintained, as well as improved *timeliness* of reports.

Quality of data will be increased primarily because uniformity will be attained in preparation of data and presentation of the finished product.

Increasing the quantity of data available in a centralized location will permit higher staffs to base their decisions and determinations on the optimum, rather than the minimum, of information.

Savings of time will be effected in making summary data available at the Department of Army level. At present, reports are prepared by field commands each month-end for department level, then forwarded to Department of the Army where they are summarized. Under the proposed plan, field preparation and submission of summary data will be eliminated. This in turn will reduce the lead time enforced by month-end submission. It is expected that this lead time can be reduced up to 50 percent. Summary data will be available at the



At Machine Records Units in the field, data is processed for forwarding to The Adjutant General's Office in Washington.

Department of the Army level immediately after receipt of the daily transactions forwarded by field commands.

While all of these advantages may be expected, it must be remembered that the proposed equipment and reporting system has its limitations; moreover, there are several problem areas that are not easily solved. Accordingly, for at least six months, the existing system will be maintained alongside the proposed system.

ELECTRONIC data processing machines, it must be emphasized, will perform only in accordance with instructions that have been provided—in other words they cannot think or exercise judgment, nor can they initiate action or actually substitute for management. They can merely provide computations that help management.

While the machines have high speeds and are tremendously flexible in their capacity, they can only perform in accordance with the instructions which have been provided. Development of such instructions in coded or abbreviated form is a function known as "programming." This requires both an extremely detailed knowledge of the subject matter and of the equipment. Such programming must be developed to the minutest detail. The simplest operations will require at least one hundred instructions; more complex ones will require thousands.

It is estimated that it will take the remainder of this year to program only those operations pertaining to initial maintenance and preparation of personnel data reports for the active establishment. Radical changes in end products may result in extensive changes in programming that may take weeks or months to accomplish. It is apparent, therefore, that use of ADPS demands a closely coordinated effort between staff planners and policy makers, and the opera-

tional personnel who develop the data upon which plans are based.

ANOTHER major consideration that must be reckoned with is that inaccuracies due to human fallibility are inevitable. The system requires receipt of some 50,000 changes a day, or 12,000,000 annually. All of this comes in from thousands of personnel officers and personnel clerks. If only a 2 percent input error is assumed, this means that 240,000 errors of input may occur each year. These must be discovered and rectified. Only by test operations can it be determined how effectively and acsuch a $_{
m file}$ curately can maintained without developing a tremendous control activity for analyzing incorrect or delayed reporting.

The program, it should again be emphasized, would have little or no effect on the operation of field units. Their activities will remain largely unchanged. Major changes would occur at departmental level and to a lesser extent at major command level where the MRU's will be relieved of some of their month-end summarizing activities.

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rs aHowever, simplification and clarification of field unit administrative activities is a very important and fertile area for developing management improvement. Extensive studies in this area are being made by The Adjutant General's Office.

All in all, the expense and complexity of the equipment require that progress be made carefully and cautiously. The experience of others indicates that a minimum of two years is required between the time a review of a project is initiated for possible ADPS appli-

cation until it is actually tested on the equipment. Therefore the approach has been to proceed with caution—i. e., taking a bite large enough to justify use of the equipment, but not to the point where indigestion may result.

Another pitfall to be avoided is the danger of working for the system or equipment instead of having the system work for the Army. One objective must always remain paramount—to provide data and records essential to management.

PREPARATION for putting the ADPS program into effect began in 1954 when two experienced electrical accounting machine specialists were sent to a course of instruction conducted by one of the manufacturers. In April Major General John A. Klein, The Adjutant General, appointed a committee to make a systems analysis of TAGO functions that could properly be transferred or absorbed in a unified automatic data processing system. This committee recommended a program at Department of the Army level which has been approved by the Office of the Secretary of Defense.

Present plans—which must include the necessary production lead time for the delivery of equipment—call for originating the program by 1 January 1957. To begin the program, it was decided to start with an operation already mechanized, but to change the Army Personnel Accounting System in such a manner that the end products would be more timely and accurate, and concurrently save manpower and equipment.

Future expansion of the program to other administrative functions

will necessarily be on a phased basis. It is anticipated that experience gained will be invaluable in planning for other activities. The initial group of programmers now has been trained. Personnel are available as a nucleus for the more rapid training of others in this field.

Currently being explored is the possibility of utilizing a machine-prepared DA Form 66 (Officers Qualification Record) in lieu of the Department of the Army copy presently maintained by the Career Management Branches. If successful, this will eliminate the tedious posting of daily changes received in the Form 66A.

OTHER areas of possible application which will be studied include accounting for reserve personnel and preparation of the troop program, both primary and mobilization. Mobilization requirements merit special consideration, for the impact on the system that would be imposed by rapid troop expansion has not as yet been thoroughly developed. If necessary, however, a reversion to the present method of punched card operations, which was proved during World War II, could always be made with no serious disruption of service.

AS ITS immediate goals, ADPS will seek to effect personnel and equipment savings and to provide more timely information to management. The plan in its initial phase will affect primarily the record keeping and personnel accounting functions performed at Department of the Army level, and to some extent those at major command levels. A continuous analysis of various TAGO operations is being conducted to insure that the full benefits and unlimited potentialities inherent in electronic data processing will be fully and effectively utilized.

-Versatile Radio for Airborne Operations-

PACKING more power into smaller space, a versatile new long-range radio transmitter-receiver for jeeps, tanks and trucks can be parachuted in its vehicle and placed in operation within a matter of minutes.

Developed by the Army Signal Corps Engineering Laboratories and the Collins Radio Company, Cedar Rapids, Inc., the set combines advanced design with improved components. It has a wide frequency range, covers more distance—up to 2,000 miles—and can send messages over mountains and other barriers without relay radios.

Both voice and radio teletype messages can be sent and received at the same time. By adding a few parts, the new instrument also can link in the Signal Corps lightweight 100-word-per-minute teletypewriter. If desired, the transmitter can be remotely controlled from distances up to 75 feet.

The new radio has seven channels which are pre-set as in push-button models. Thus a beginner can learn how to operate the set in ten minutes. The radio automotically tunes itself and its antenna. Power comes from the vehicle's regular battery, plus a special generator. The set has been operated in temperatures from minus 40 to plus 149 degrees Fahrenheit. Maintenance is simplified by plug-in replacement of defective parts; the removed part then can be repaired later at a Signal Corps depot.

At CONARC Board No. 5's school of hard knocks, they test the ruggedness and reliability of

Hardware for Combat

Colonel Frank C. Paul

IN 1863, Rear Admiral Samuel F. DuPont wrote to the Assistant Secretary of the Navy—

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"I think these Monitors are wonderful conceptions, but, Oh, the errors of detail which would have been corrected if these men of genius could be induced to pay attention to the people who use their tools and inventions."

In performing its mission of service testing communication and electronic equipment, and airborne equipment including aircraft, CONARC Board No. 5 at Fort Bragg, North Carolina, has the responsibility of anticipating and forestalling just such expressions by eventual users of Army hardware.

To achieve this, close coordination with engineering and developmental agencies is necessary. Based upon Army requirements, Continental Army Command prepares Military Characteristics, which when approved become the basis of development. In this process CONARC boards are the crucial link between the developer and the user, guiding the former and serving the latter. (See "CONARC's Role in Development and Test," May 1956 Digest.)

Board No. 5 is of comparatively

recent origin, going back to July 1954 when it was activated by Continental Army Command, then Army Field Forces. However, its Airborne and Communication and Electronics Service Test Divisions had been formed in August 1945 as part of Army Field Forces Board 1, at Fort Bragg, North Carolina. Also a part of Board 1 at that time were test sections for Field Artillery, Coast Artillery, Antiaircraft Artillery, Rocket Artillery and an Air Support section. An Army Aviation Service Test Division was later added.

The various artillery test divisions were reorganized and regrouped several times until finally, in July 1954, Board 1 was divided, with Field Artillery and Army Avition (now Board No. 6) test divisions going to Fort Sill as Board 1, and the two test divisions (redesignated as Board No. 5) remaining at Fort Bragg.

At present, Airborne Service Test Division is the direct and only descendant of the pioneer Airborne Test Platoon organized at Fort Benning, Georgia, in 1940, as the first airborne unit of the United States Army. The Communication and Electronics Service Test Division, initially organized in August

COLONEL FRANK C. PAUL, Artillery, is President, CONARC Board No. 5, Fort Bragg, North Carolina.



The T-10 personnel parachute was tested in more than 7500 jumps before adoption.

1945, assumed the test functions previously performed by the Signal Board at Fort Monmouth, New Jersey, and the various service and combat arms schools.

THE latter Division is concerned with those items which are common to more than one arm or service. In the field of communications this includes such things as man-packed radios, vehicular radio sets, radio relay systems for the Army in the field, switchboards, field telephones and wire circuits, and related test and maintenance equipment. In the electronics field it includes Infantry sound locating sets such as the GR-6 and the AN/TND-1, and battlefield surveillance equipment.

Items tested by this division are primarily developed by the Signal Corps Equipment Laboratory; but some items, such as those in the infrared categories, are developed by the Engineer Research and Development Laboratories. testing is performed in conjunction with these laboratories, some is done entirely by Board personnel, while at still other times it is necessary and advisable to place items in the hands of troop units for test. A recent example of the latter was the SB-86 Regimental Switchboard which was tested by the 82d Airborne Division.

AIRBORNE Service Test Division tests all items of airborne equipment such as parachutes and heavy drop systems. It also tests all cargo aircraft of the Army, Navy and Air Force to determine their suitability to support Army airborne operations—i.e., the transport of Army units to combat by air. In addition the Airborne Division tests all items of Army equipment as to their suitability for aerial delivery and air transportability if that item is intended for use in any phase of an airborne operation.

By joint agreement, engineering and development of airborne and air items used by either the Army or the Air Force, or both, are done by the Wright Air Development Center at Dayton, Ohio, an Air Force agency. Close coordination and mutual assistance between the Airborne Test Division and the Air Force are vital and necessary. This is accomplished by liaison officers, visits and integrated work programs. In the testing of Air Force aircraft such as the C-123,

for example, service tests are usually of a joint nature between the Board and the Air Proving Ground at Eglin Field, Florida. In the case of Army aircraft, testing is done jointly with CONARC Board 6 at Fort Rucker, Alabama. Navy aircraft are usually tested jointly with the Navy and Marine Corps at the Naval Air Test Center, Patuxent, Maryland, and designated Marine bases.

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Both test divisions maintain extensive liaison with civilian contractors in order to monitor items under contract and to keep these agencies informed as to what is desired in the end product.

FOLLOWING are projects typical of the Board's activities in monitoring, coordination and testing of Army items:

RADIO SETS AN/PRC-8, 9 AND 10 (man-pack radio sets) were tested in 1949, found suitable and adopted as standard equipment by the Army. These sets replace the old World War II SCR-300 pack radio and some applications of Radio Sets SCR-510, 610 and 619 used at platoon and company level. They are only half the weight and size of the SCR-300 but have the same range and many more channels. The three sets-8, 9, and 10-are identical except for different frequencies each for Armor, Artillery and Infantry.

Parachute T-10. The old T-7 personnel parachute of World War II days was not completely satisfactory because of the opening shock experienced by the parachutist and the high rate of descent. Subsequent engineering development culminated in the present

T-10 parachute which, because of its increased diameter, change in shape and different deployment system, considerably reduced opening shock, malfunction rate, and rate of descent. It is, however, more difficult to collapse on the ground in high winds, necessitating more experience and training in its handling.

In testing the T-10, Board members conducted more than 7,500 jumps from various types of cargo aircraft, at speeds varying from 100 to 150 knots and in ground winds up to 20 miles per hour. In addition, thousands of feet of high speed motion pictures were taken and studied before final recommendations were made.

Man-packed radio sets of this type were field tested before adoption as standard Army equipment.



AN/GRC-19 AND -46. The AN/ GRC-19 is a new vehicular radio set designed primarily for use at battalion, regimental and division levels, and was used by troops for the first time in Operation Sagebrush. The transmitter incorporates automatic tuning in all stages and has a nominal output of 100 watts requiring a special high capacity vehicular generator. The average reliable range using ground wave propagation is 35 miles; from 35 to 50 miles contact is sporadic; using sky wave propagation, the sets are reliable from 50 to 1,150 miles—the maximum range tested.

By adding a Teletypewriter TT-98FG (modified) and a shelter to the GRC-19, a highly mobile radioteletype station is obtained (AN/ GRC-46) capable of being mounted

on a %-ton truck.

AIR TRANSPORT OF THE 280-MM. Gun. In 1953 studies were launched to determine the feasibility of moving the 280-mm. Gun by air. Indicating the magnitude of the problem, the complete gun including transporters was approximately 85 feet long and 86 tons in weight. Yet without undue difficulty the gun was disassembled into four loads, each transportable in the C-124 airplane.

AN/TCC-7 Communications System. To provide a 12-channel communication system for intermediate area use, Army to Corps and Corps to Division, a new series of equipment was developed and is now in use in the field. These consist of such items as Telephone Terminal AN/TCC-7, Telephone Repeaters AN/TCC-8 and 11, Cable

Assembly CX-1065/G (spiral four cable), Radio Set AN/TRC-24, and associated interconnecting facilities.

These items may be used in various combinations to form a telephone carrier system, which provides 12 carrier telephone channels over a single nonloaded spiral-four cable radio relay, or cable plus radio relay for distances up to 200 miles. Voice, telegraph, data, or facsimile transmissions may be passed over this system.

C-130 Cargo AIRPLANE. Development of the C-130 cargo airplane clearly exemplifies the broad and divergent yet closely coordinated responsibilities and duties of Board No. 5.

Previously none of the medium cargo aircraft had been specifically designed from the ground up to meet the Army's aerial transport needs. Rather, the Army had to accept what was available and make the best of it. Several years after World War II, the Army stated its requirement for a troop cargo transport in the 25,000pound cargo category. In coordination with the Air Force (which procures this type of item) specifications were prepared including those details desired by both services and acceptable to both.

While coordination was effected at Department of Army level, Board No. 5 working through CONARC (then Army Field Forces) advised and assisted in the formation of Army specifications, including such diverse features as payload, range and radius, seating, lighting both day and night, aerial delivery provisions, personnel parachute provisions, heating, ventilation, sanitation, landing and take-

off characteristics, ground loading and unloading characteristics, height, strength and surface of floors and ramps, size and shape of doors, emergency exits, litter provisions and tie-down facilities.

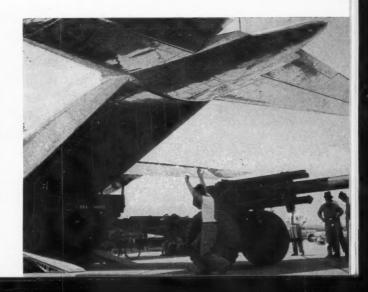
Bids were obtained from interested aircraft manufacturers and the contract let, in this case to Lockheed Aircraft Corporation. The manufacturer's next step was to build a full-scale mock-up. This was inspected by a "Mock-up Board" in the spring of 1952, with Board No. 5 members serving in an advisory capacity to the voting Army member. The purpose of the Board was to compare specifications to the mock-up, note discrepancies and submit requests for alterations. These requests have been monitored by Board No. 5 since that time and will be checked again in the test aircraft.

Service test on the first aircraft will begin in the fall of this year at the Air Proving Ground, Eglin Field, Florida. As the Army's interest in the aircraft is closely related to and sometimes overlaps that of the Air Force, service tests of the C-130 are being conducted in close coordination, with the Air Force providing the test pilots and crews and the Board providing personnel and equipment to perform the Army's suitability tests for aerial delivery and air transport of personnel, supplies and equipment. After the first flight and landing tests are conducted at Eglin Field, test activities will move to Pope Air Base at Fort Bragg.

Even after acceptance of the aircraft, the Board will continue to monitor its performance throughout the world and will suggest or test any further modifications deemed necessary.

WHETHER it be an improved radio headset or a newly developed cargo aircraft, the Board's business is hardware—its testing and perfection to achieve maximum combat effectiveness. In every aspect of its operations, the Board's job is to serve, by finding the best possible piece of equipment to fill the soldier's needs.

A 2½-ton truck and a 155-mm. howitzer are loaded aboard a C-130 Medium Transport plane in air transportability tests by CONARC Board No. 5.



Farthest North Airdrop

Lieutenant Colonel Stephen J. Meade



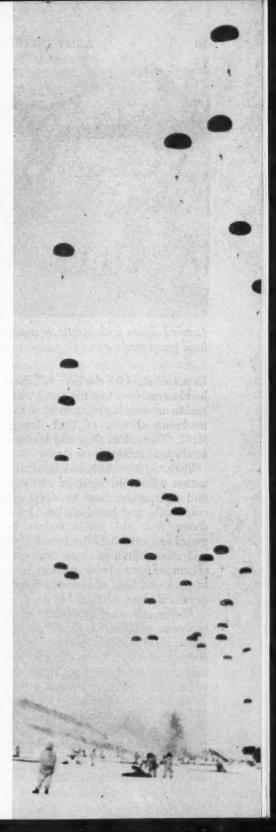
A SNOWSTORM OF parachutes descended from Arctic skies on frozen Wolstenholme Fiord, Greenland, last March as 700 paratroopers of the 82d Airborne Division participated in a joint Army-Air Force exercise known as Arctic Night. As part of the operation, Army airborne troops carried out the largest and only tactical drop ever made above the Arctic Circle, just 809 miles from the North Pole.

For the remainder of the daylight hours—brief in the far Arctic in those March days—and into the darkness the men of the 82d moved in the -40° cold, then bivouacked for the night to complete their problem the next day. The actual problem consisted of both an attack and defense of an "air base" in the Far North. Studies of the problem will be used to develop procedures and techniques for future joint Army and Air Force operations in the Far North.

In dramatic fashion the exercise demonstrated that airborne troops can be used in the Arctic. Valuable training for both services also was obtained. In addition to the arctic indoctrination of the airborne troops, experience was acquired in the split second timing and coordination required to mount such an exercise and keep it supplied from the air.

Most of the men of the 2d Battalion Combat Team, 504th Airborne Infantry Regiment—the only Army unit to participate—had had no previous arctic experience. Many in fact had never seen deep snow.

LIEUTENANT COLONEL STEPHEN J. MEADE, General Staff, is Assistant Chief of Staff, G1, Headquarters, 82d Airborne Division, Fort Bragg, North Carolina.





Loaded down with Arctic equipment, troopers preparing for the Greenland jump made a practice descent prior to the exercise.

In preparation for the exercise, they had learned how to pitch arctic tents and to use heating equipment in the moderate climate of Fort Bragg, N. C. There, too, they had learned to ski by practicing on straw.

Training also included familiarization with cold weather clothing and equipment; how to sleep on, cook with, and build shelters from snow; first aid fundamentals to guard against frost bite, trench foot and snow blindness; new concepts of camouflage and concealment; how to pack and haul *ahkios*—the handdrawn sledges of the northland.

Above all they learned what weapons will and will not do in subzero climates. Having gone through an intensive training period under the supervision of Arctic experts, the battalion carried out a battle-indoctrination jump, dressed in heavy arctic clothing and carrying full equipment. They put into practice their training in trail-breaking, land navigation and patrolling.

THE Army contingent—700 paratroopers—left Fort Bragg in C-124 Troop Carrier planes, each carrying a load of 60 fully-equipped paratroopers with their *ahkios*, squad tents, arctic stoves, ammunition, rations, communications equipment and personal dunnage. Included in the movement were the officers and men of the 2d Battalion and attached units of pathfinders, 4.2 mortarmen, medics, engineers and parachute maintenance personnel.

The first leg of the 3,500-mile journey took them to Goose Bay, Labrador, in eight hours of flying time. Next day they flew for nine hours to land at Thule Air Force Base, Greenland.

There the Battalion Combat Team concentrated on organizing the men and equipment in the new area, then launched into more extensive training including practical field work in setting up tents, skiing, patrolling and establishing communications. A bivouac area was set up on North Mount Dundas. The men pulled the *ahkios* carrying their individual equipment and weapons, while weasels pulled larger sleds carrying fuel and heavier equipment. Temperatures ranged down to 35 degrees below zero, with winds up to 15 knots, compelling the men to utilize all the cold weather indoctrination they had received previously.

Training at this stage included building snow shelters—modified igloolike structures—using blocks sawed from the frozen snow, spending the night in them, then conducting firing exercises with all types of unmounted infantry arms.

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ng ew excal king A 54-hour tactical problem early in March concluded the training phase of Arctic Night. Starting with a simulated parachute jump (commonly referred to as a tailgate drop) on North Star Bay, the problem simulated actual jump procedures, with the Pathfinders

setting out panels and flares to mark the drop zone.

Having assembled with the aid of the panels, the companies marched in tactical formation across one of the fingers of the bay to a heavy drop resupply point eight miles away. There they picked up *ahkios* loaded with tents, Yukon stoves, basic equipment, then set up a perimeter defense and prepared to bivouac for the night. A windbreak was built up from snow blocks on the windward side to protect the tents from the -45° winds.

Next day the unit went into the attack, assaulting the objective with two companies abreast, and prepared a drop zone for an aerial resupply of fuel and food to sustain them through their second night. Returning to Thule on 10 March the men cleaned their equipment and made other last-minute preparations for the actual operation of Exercise Arctic Night.

Returning from a session of ski practice on straw, troopers prepared at Fort Bragg for arctic conditions they would soon encounter.





On landing (above) troopers construct ice caves as shelters before attacking the simulated "enemy stronghold" (below).



The rehearsal had pointed up their previous training.

AT 0730 hours on 14 March the 700 men of the Battalion Combat Team made their jump. Pathfinder and combat control personnel had preceded them by 20 minutes. Setting up a wind tee, they relayed weather and wind conditions to the approaching aircraft, set out green smoke flares and marked unit assembly areas at the shoreline with

panels and smoke.

Now the unit for

Now the unit found that all its previous preparation was paying off. Infantry techniques must be drastically modified in the Far North where wide expanses of snow and ice afford no concealment. The terrain also is extremely deceptive—what looks like a small mound two or three hundred yards away may actually be a fairly large hill a mile or so away. In Arctic "whiteouts" in summer, or in winter blizzards, visibility often drops to zero.

Control is complicated by difficulty in identifying individuals dressed in identical white camouflage suits, and in communicating verbally with the parka hood "buttoned up" against the elements. The hood also reduces the trooper's range of vision and hearing.

Because troops must either keep moving or take shelter in tents to keep from freezing, the attack must be carefully planned and coordinated to prevent excessive delay in the attack or assault position. Visual signals must be used to augment communications because of the effects of the extreme cold on radios. Hand sets freeze or the operator's breath forms ice on mouthpieces; special cold weather batteries must be substituted for those

used in moderate climates.

During actual operations, the necessity for such careful planning was strongly emphasized. Sudden changes in the weather at one point forced the Project Safety Officer to recommend that the attacking unit take shelter at once.

THE first phase—airborne assault—went off swiftly and efficiently, with only eight minor injuries and loss of only four *ahkio* loads of equipment due to failure of one heavy drop parachute. The drop zone area was larger than under normal climatic conditions, but despite this and the encumbrances of arctic clothing, rucksacks and *ahkios*, the entire BCT quickly closed in the assembly area.

Leading elements had advanced inland for more than two miles, only to be stopped by umpires because they ruled the exercise had progressed ahead of schedule. The stop, short as it was, meant erecting warm-up shelters. By H plus 5 the first objective was seized, and the BCT was moving over the frozen ground to its second objective, an enemy installation on high ground a mile to its right front.

But that mile proved a long one, for increasing winds with blowing snow caused the Safety Officer to recommend a halt. In view of an imminent wind chill condition, a tent camp was pitched on the reverse slope of the second objective.

That night the BCT commander received orders for his unit to relieve pressure on a simulated companion unit by staging an attack the next day on enemy positions at the northern portion of the base airstrip and on the opposite slope of North Mount Dundas. Plans

were formulated and orders issued

by the close of D-Day.

At 0730 on D plus 1, the whiteclad troopers acting under the changed orders, took up their march. Again unfavorable weather conditions arose to cause cancellation of a preplanned supporting air strike on enemy antiaircraft batteries located across the airstrip on top of South Mount Dundas. However, the attacking ground troops were screened by reduced visibility, limited to a few hundred yards.

Within two hours, contact was made and a brisk fire fight developed with the Aggressor troops, who were augmented by Air Force and Army unit personnel from Thule to furnish added realism to the exercise. Taking advantage of the reduced visibility conditions, one company of the attacking force made a rapid flanking movement, the enemy position was carried, and approximately 150 prisoners taken. By 1030 hours the BCT had reorganized on position.

Although ground distance covered during the exercise totalled approximately 12 miles, with deployment, administrative halts, and maneuvering the BCT had demon-

strated the capability of averaging two miles per hour cross-country with its equipment.

SUPPORTING the operation, aerial resupply was accomplished by C-124 Globemasters of the 63d Troop Carrier Wing from Donaldson Air Force Base, South Carolina. These same aircraft were used to transport the men and their gear to Thule and back to Fort Bragg.

In the ensuing critique held by Lt. Gen. Glenn O. Barcus, Commander-in-Chief, U. S. Northeast Command, and Maj. Gen. T. J. H. Trapnell, Commanding General, 82d Airborne Division, both Army and Air Force commanders agreed that the airborne exercise—farthest north operation of its type in history—had provided a wealth of information for the future of airborne troops in arctic operations.

Further, the exercise proved that by utilizing available equipment and facilities to the maximum, an airborne unit can move to any place in the Arctic, and with proper cold weather training and adequate logistical support can live, move and fight for an indefinite period

of time.

"The Big Picture," official Department of the Army weekly TV series, opens its sixth national season on 7 October 1956 with the program "Exercise Arctic Night," featuring actual maneuver scenes filmed on location.



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REGULAR OFFICER AUGMENTATION ACT

Lieutenant Colonel Ernest A. H. Woodman and Major E. D. Bryson

I-MAIN FEATURES OF THE LAW

THE ARMED FORCES Regular Officer Augmentation Act of 1956 (Public Law 737—84th Congress) comprises extremely important legislation destined to have a marked impact on the structure of the Regular Army Officer Corps. It tends to reduce turnover of experienced Reserve officers; to encourage greater numbers of young Reserve officers to apply for Regular commission; to eventually eliminate the "hump" in the Regular Officer Corps brought about by the post-World War II integration; and to provide the Army with a larger "hard core" of professional leaders.

The Act does not apply to civilians who have never held commissioned status (except for 200 critical specialists), officers who have not served for at least one continuous active duty tour in excess of 90 days, nurses and certain types of medical specialists, and to the ap-

pointment of doctors and dentists.

In essence, the Act contains the following important features pertaining to the Army:

- It increases the Army's Regular male and WAC commissioned officer authorized strength from 30,600 to 49,500. This ceiling does not include female medical officers, West Point professors or warrant officers, nor does the Act have application to them.
- It provides for the appointment of Regular commissioned officers without restriction as to the grades in which appointed.
- It requires that any officer appointed be of such age as to permit him to complete 20 years of active commissioned service before attaining age 55.
- It provides, with certain exceptions (pertaining to the Veterinary, Chaplain's, Judge Advocate General's and Medical Service Corps) that an individual with no active Federal commissioned service may not have passed his 27th birthday at time of appointment.
- However, further provision is made that, except for short training tours, and at the discretion of the

LIEUTENANT COLONEL ERNEST A.
H. WOODMAN, Artillery, is Chief, Regular Army Officer Section, Procurement
Branch, Office of the Deputy Chief of
Staff for Personnel. MAJOR E. D. BRYSON, Adjutant General's Corps, is Regular Army Augmentation Project Officer,
Management Branch, Comptroller Division, The Adjutant General's Office.

Secretary of the Army, an appointee may be given promotion list service credit equal to the number of years, months and days of active commissioned Army service he has performed since 6 December 1941 and after reaching age 21—plus not more than one of the following additional supplemental periods:

(An appointee receiving constructive credit under any of the three following provisions should understand that total credit may not exceed his age minus 27):

(1) FIRST SUPPLEMENTAL CONSTRUCTIVE CREDIT PROVISION. For a commissioned officer on active duty on the effective date of the Act (20 July 1956), a period not to exceed eight years and equal to the number of years, months and days by

which his commissioned service creditable for basic pay purposes (this includes commissioned service while not on active duty) exceeds his active commissioned service.

(2) SECOND SUPPLEMENTAL CONSTRUCTIVE CREDIT PROVISION. Up to eight years for not more than 200 outstanding specialists in critical fields who can meet criteria approved by the President and the Secretary of the Army.

(3) THIRD SUPPLEMENTAL CONSTRUCTIVE CREDIT PROVISION. For all others, constructive service credit may be granted for a period not to

exceed two years.

THE PRESIDENT and the Secretary of Defense have authorized the Regular Army to attain 72 per-

ILLUSTRATIVE EXAMPLES OF SERVICE CREDIT PROVIDE

GENERAL PROVISION

AN APPOINTEE MAY, AT THE DISCRETION OF THE SECRETARY OF THE ARMY, BE CREDITED WITH HIS ACTIVE COMMISSIONED SERVICE PERFORMED SINCE 6 DECEMBER 1941 AND AFTER REACHING AGE 21.

Example 1:

Applicant, 40 years old at appointment, has 15 years active commissioned service at appointment creditable under this provision. Since this is greater than his age minus 27, he may receive no constructive credit, but may be credited with the full 15 years.

Example 2:

Applicant, 40 years old at appointment, has 18 years active commissioned service, all performed since age 21. However, two years of it were performed before 7 December 1941; therefore, he may be credited only with 16 years.

FIRST SUPPLEMENTAL CONSTRUCTIVE CREDIT PROVISION

A COMMISSIONED OFFICER ON ACTIVE DUTY ON THE EFFECTIVE DATE OF THE ACT MAY RECEIVE CREDIT FOR A PERIOD NOT TO EXCEED EIGHT YEARS EQUAL TO THE AMOUNT BY WHICH HIS COMMISSIONED SERVICE CREDITABLE FOR BASIC PAY EXCEEDS HIS ACTIVE COMMISSIONED SERVICE.

Example:

Applicant, 40 years old at appointment, was on active duty on effective date of Act. He has 10 years active commissioned service and 5 years service as Reserve Officer not on active duty. He could receive 10+5, or 15 years credit, BUT this exceeds his age minus 27; therefore, he may be credited only with 40 minus 27, or 13 years.

cent of statutory authorization (35,640 officers) by July 1958, and 80 percent of authorization (39,600) by July 1963. However, approval of officer procurement beyond 39,600 has been withheld until such time as the Army is approaching this figure.

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To achieve currently authorized strength levels, the Army has initiated two officer procurement programs. The first consists of stepping up annual procurement of young officers from the present figure of about 1350 to the approximately 1900 that will be required to support the enlarged Regular officer corps. This increase of normal annual procurement is at least as important a part of the implementation of the new law as is the second program—initial augmentation in

the higher brackets—and will be achieved primarily by expanding the intake of officers from normal procurement sources.

APPOINTMENT of 7,000 officers is planned during the initial augmentation approximately as follows:

Grade									Total
Colonel									20
Lieutenant co									800
Major									1.400
Captain									2,700
1st lieutenant									1.630
2d lieutenant									450
Total									7,000

The most important source for these new Regulars consists pri-

ARMED FORCES REGULAR OFFICER AUGMENTATION ACT

SECOND SUPPLEMENTAL CONSTRUCTIVE CREDIT PROVISION

NOT MORE THAN 200 OUTSTANDING SPECIALISTS IN CRITICAL FIELDS WHO MEET CRITERIA APPROVED BY THE SECRETARY OF THE ARMY AND THE PRESIDENT MAY RECEIVE UP TO EIGHT YEARS CONSTRUCTIVE CREDIT.

Example 1:
Applicant, 40 years old at appointment, qualifies as one of the 200 critical specialists. He has 5 years active commissioned service. He may receive 5 + 8, or 13 years credit, which just equals his age minus 27.

Example 2:

Applicant, 32 years old at appointment, qualifies as one of the 200 critical specialists and has no previous military service. He could receive 8 years credit, BUT this exceeds his age minus 27; therefore, he may be credited only with 32 minus 27, or 5 years.

THIRD SUPPLEMENTAL CONSTRUCTIVE CREDIT PROVISION

AN APPOINTEE WHO DOES NOT QUALIFY UNDER EITHER OF THE OTHER TWO PROVISIONS MAY RECEIVE NOT MORE THAN TWO YEARS CONSTRUCTIVE CREDIT.

Applicant, 40 years old at appointment, has 12 years active commissioned service. He could receive 12 + 2 or 14 years credit, BUT this exceeds his age minus 27; therefore, he is credited only with 40 minus 27, or 13 years.

Applicant, 40 years old at appointment, has 10 years active commissioned service. He could receive 10+2 or 12 years, BUT his age minus 12 exceeds 27. Therefore, he is INELIGIBLE.

marily of career Reserve officers now serving on active duty. However, provisions do exist for the appointment of Reserve officers and National Guard officers not on active duty, but there is no way of formulating accurate estimates as to the numbers eligible, qualified and interested who might apply.

On the other hand it can be roughly estimated that 40,000 Reserve officers on active duty will be both eligible and interested, and it is expected that the lion's share of available appointments will go to

this group.

THE broad policy with regard to selections reflects two primary considerations. In fairness to both the Army and the individual, only the officers who have performed best and have demonstrated the greatest potential will be selected. Other important factors such as branch considerations and length-of-service will be subordinated, so as not to eliminate deserving applicants on grounds that the individual is serving in an overstrength branch, or that he is in the "hump."

However, the structure of the Regular officer corps can not be thrown further out of balance by additional appointments in the hump bracket created by post-World War II appointments. Such procedure would have such undesirable results as stagnating promotions, and causing the loss of too large a portion of the Regular officer corps within a relatively short interval, at which time "hump procurement" would be required if strength levels were to be maintained.

Accordingly it is necessary to offer those officers who are selected, and whose promotion list credit would further aggravate the "hump", up to two years less promotion list credit than they would otherwise have received.

This is not a new procedure. Many Regular officers now serving in the Army do not have full credit for all of their active commissioned service. Furthermore, all officers do not consider this entirely a disadvantage, as it results in up to two years more active duty than the individual would otherwise serve. For those who are still educating their children and require full—rather than retired—income, it is extremely desirable.

II—GENERAL IMPLEMENTATION PROCEDURES

IMPLEMENTATION plans have been completed for the selection and appointment of the initial 7,000 Regular officers, except those "200 outstanding specialists in critical fields." These specialists will be procured through a separate program, to be announced after the President approves the criteria. The basic features of the implementation plan, as approved, are announced in Department of the

Army Circular 601-26, dated 13 August 1956.

Regular officer selections for this program will be centralized at the Department of the Army level, and will be accomplished by a group of Regular Army full colonels headed by a General officer. Selections will be based on the composite mature judgment of these senior officers using application files, TAG 201 Files, and appro-

priate guidance to be provided by the Deputy Chief of Staff for Personnel—rather than from the Chiefs of the Technical and Administrative Services or the Chiefs of the Combat Arms career branches—thus reflecting the policy that Army-wide considerations will take precedence over branch considerations.

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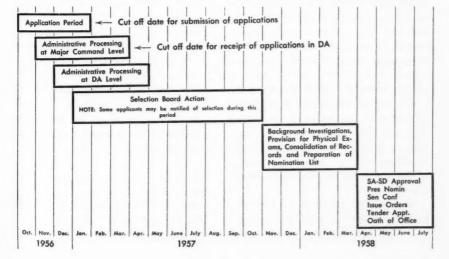
IMPLEMENTATION procedures begin with the submission of applications from interested candidates in accordance with the provisions of the implementing Circular. Administrative screening will be conducted in the field to ensure that all necessary application documents are properly accomplished and that data submitted is in accordance with the individual's field records. At this time, applications of those who do not qualify under the law will be returned.

Also, in the field, special Evaluation Indorsements will be secured from the applicant's rating officers; the Educational Requirements Test will be administered if qualification has not been established by other means; board interviews will be conducted on some applicants (primarily those with less than five years recent active duty service, or applicants not on active duty); and other necessary documents required by the Circular will be attached to the individual's application file.

When this application file reaches Department of the Army, administrative checking will be accomplished to verify completeness and accuracy and service credit will be computed.

Application files, together with other available records, will then be forwarded to the selection boards. These will operate in a manner similar to promotion boards selecting full colonels on the "best qualified" basis. (See "The Officer Promotion Story," in April 1955 Digest.) First, all officers who are "fully qualified" for Regular appointment are to be chosen; then the "best qualified" will be selected and listed in order of merit. Selections will be made from the top of





the list until all vacancies have been exhausted.

The next step will be to effect the consummation of appointments. During this period final selections will be submitted to the Secretary of the Army and the Secretary of Defense for approval, from there to the President, and then to the Senate for confirmation. After this, orders will be issued and appointments tendered. It is not until the oath of office is taken that appointment as a Regular Army officer becomes official.

A PROPOSED time-schedule has been worked out to provide smooth and coordinated operation of this program in a manner which will provide administrative echelons and selection boards with sufficient time to do justice to the Government and to the individual. (See chart on preceding page.)

Every safeguard and control is

being utilized to ensure that every application is handled in the same manner and receives the same consideration. All applicants found ineligible at the major command level will be notified immediately by the major commander concerned. All applications forwarded to the Department of the Army will be assigned a number so that each can be accounted for. At this time the individual concerned will be notified by postal card to the effect that his application has been received and is being considered.

From this time on, inquiries and correspondence are pointless and can serve no other purpose than to delay the over-all operation. One substantial contribution every officer can make toward the on-time completion of the augmentation program is to refrain from writing letters to the Department of the Army requesting information re-

garding his status.

III—RESPONSIBILITIES OF APPLICANTS

BEFORE forwarding their applications, applicants should carefully check all entries they have made on the respective forms against the instructions contained in the implementing Circular. This is absolutely necessary, as the Circular requires certain information to be entered under "Remarks" which is nowhere called for on the form; in addition it specifies the number of copies required and contains other directions. Much administrative backtracking will be avoided if meticulous attention is paid this important aspect.

Those applying will be required to furnish the following documents:

(1) Application for Appoint-

ment (DA Form 61, dated 1 July 1956).

(2) Photograph of applicant taken within past twelve months, head and shoulders type, no smaller than three by five inches.

(3) Transcript of credits from an accredited college or university if a degree or two or more years' college credit is claimed. In the event that the transcript indicates an earned credit total which is less than that required for a degree, the transcript must include an indication or statement from the college or university that the applicant is entitled to at least junior (or third year) standing in a course leading to

a BA or BS degree.

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(4) In lieu of a college transcript, evidence of qualification that may be substituted therefor include: possession of the Medal of Honor, the Distinguished Service Cross, or the Distinguished Service Medal; successful completion of the Educational Requirements Test within the past two years; or the College-Two-Year Equivalency Evaluation. (In the absence of any such evidence submitted by an applicant, the major commander will arrange to administer the Educational Requirements Test during the processing.) It should be noted that successful scores made on the General Educational Test, College Level, alone, will not be accepted.

(5) Loyalty Certificate for Personnel of the Armed Forces, DD

Form 98.

(6) Statement of Personal History, DD Form 398.

(7) FBI Fingerprint Card.

(8) Certificate as to citizenship, for those not citizens by birth.

(9) Affidavit – from former conscientious objectors, only.

(10) Certified true copy of photostat of birth certificate.

(11) Officers' Assignment Preference Statement, DA Form 483 (for applicants *not* on active

duty, only.)

Documents which may require some time to obtain consist primarily of college transcripts and birth certificates. Also, the statement of personal history sometimes calls for items of information not immediately available to the individual. Persons interested should take steps *immediately* to secure documents or information requiring correspondence in order that applications can be forwarded early.

IT IS INCUMBENT on everyone concerned to forward applications as soon as possible to avoid a flood at the Department of the Army level late in the application period, with resultant administrative delay. Necessary forms are available at all posts, camps and stations, and those interested are urged to begin working on their applications NOW. Such cooperation will ensure efficient operation of this program and make appointments possible at the earliest possible date.

Reserve Retirement Provisions-

AMONG other provisions, Public Law 547-84th Congress remedies the injustice suffered by a number of Reserve officers who, because they had completed more than 30 years of active service, were ineligible to retire in officer status. Corrective legislation which removed the 30-year limitation in 1953 (Public Law 126-83d Congress) did not benefit those officers who were no longer serving on active duty and whose Reserve grade was lower than the grade held when they were relieved from active The new law corrects this inequity by authorizing those individuals

who were retired between June 1948 and August 1953, and who apply within one year, after 31 May 1956, to be advanced on the retired list to the grade in which they would have been eligible to retire, except for the fact that they had completed over 30 years' service. Subsection 4b of the new law repeals Subsection 203f, Army and Air Force Vitalization and Retirement Equalization Act of 1948, which provided for advancement to temporary grade held on date of retirement for those officers retiring not later than 1 January 1957.

PRESERVING FOOD BY RADIATION

Colonel William D. Jackson

MUCH has been said and written about the destructive effects of the atom since the first atomic bomb was exploded in 1945. For a decade the death-dealing effects of nuclear radiations have been emphasized world-wide.

Today, however, the Army Quartermaster Corps and the Atomic Energy Commission are developing a means of using these radiations to preserve food and thus provide a better diet for the fighting man. The atom is being put to work, destroying bacteria and other micro-organisms which are the principal cause of food spoilage.

In essence, the process resembles that of taking an X-ray. Food is exposed to the invisible rays which pass through, killing any microorganisms and insects. The food itself, however, remains fresh; it is not cooked. If the food is prewrapped before exposure to the rays so as to prevent reinfection by insects and micro-organisms, it will remain preserved in its fresh form—just as it is preserved in the freezer. A significant benefit is that

irradiated foods do not require refrigeration for storage or transit. P

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CONCERNED about the accumulation of radioactive waste fission products from its nuclear program following World War II, the Atomic Energy Commission began seeking ways and means of using this material. Beginning around 1950, the Commission sponsored research on utilization of fission products for the preservation of food and, until 1953, the bulk of the work in this field was sponsored by the Commission.

At the same time the Army and the Navy supported small-scale exploratory studies of possible applications of the process in military logistics. Since 1953, the Army has carried the major share of the Government's effort in this field with some support from the Department of Agriculture. In the meantime Atomic Energy Commission transferred the main part of its program to the Department of Defense and concentrated its own efforts on the development of sources of radiation.

Since initiation of this program by the military, President Eisenhower and the Congress have in-

COLONEL WILLIAM D. JACKSON, Quartermaster Corps, is Chief, Office of Research and Development, Office of the Quartermaster General. augurated a concerted "Atoms for Peace" program. The military program on food irradiation was quite naturally swept into this stream of peaceful uses. The fact that the growing and processing of foodstuffs is one of the biggest industries in the country gave impetus to the radiation project.

Three hearings on the subject were held in 1955 by the Subcommittee on Research and Development of the Joint Committee on Atomic Energy. The White House also asked the Defense Department representatives for a discus-

sion of the program.

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From the Army's standpoint, it was emphasized that successful development of a method to preserve foods by radiation fits into the overall pattern of satisfying the logistical demands of modern war.

Under the austere conditions exacted by vertical envelopment and mobile warfare, one of the most important factors governing the morale of troops is food. In the past, the rougher the operation, the less desirable and acceptable was the quality of the food available to the soldier in sustained combat.

Currently, the Army must rely primarily on canned goods during unstable conditions. While serving emergency needs, they are not satisfactory for a sustained diet.

RADIATION preservation, it is foreseen, will contribute to future military operations in many ways. For example, the amount of fresh food for the combat soldier can be increased, inasmuch as refrigeration will not be necessary and the food will be preserved longer.

Doing away with refrigeration in the battle area in itself will constitute a significant contribution towards the Army's mobile forces. Normally, if troops in the field are to be fed as they should be, it would require one walk-in and two reach-in refrigerators for each consolidated mess of approximately 450 men. This represents a total weight of approximately pounds or an average of 19 pounds per person. For a field Army of 400,000 men, this would amount to 3800 tons. Nor does this take into account the back-up refrigeration required for storage and transit in ships, railroads, and trucks.

Eliminating the need for refrigeration not only will affect the immediate load of the refrigeration facilities themselves; it also will decrease the long line of spare parts maintenance and resupply. Cutting down on overall tonnage, with its haulage and maintenance problems, will permit release of many procurement, maintenance and repair personnel for more direct combat activities. With limited manpower, this is a highly important consideration in military operations.

IN THE light of these benefits, the logical question is—how much extra will all this cost the Army? Surprisingly, instead of costing more, radiation preservation of food will actually save money.

First and foremost, losses due to failure or lack of adequate refrigeration can be reduced. While the precise figure is difficult to estimate, a post-World War II example comes to mind of one shipload in the Western Pacific, in which more than half of the perishables—including more than 250,000 pounds of vegetables—were spoiled. Losses under actual combat situ-

ations can well be imagined.

Then, too, there are the losses resulting from infestation of grain and cereal products which while difficult to estimate, are also considerable. At one time the Army even had to discard the cereal bar from the K ration because of inability to control insect infestation. In such cases relatively low dosages of radiation would destroy all insect life. With suitable containers it would be possible to store grains and cereal products.

Again, there are still other losses which are difficult to estimate—the discarding of canned foods because of poor acceptability, the sprouting of onions, potatoes, and the like.

Successful completion of the radiation preservation of food will enable the Army, for the first time, to ship fresh meats and vegetables to all theaters and battle areas. Situations such as that which developed in World War II-when fresh meat was to be had in abundance in Australia, but none was available in the nearby northern islands because of lack of reefer ships-will be a thing of the past, Not only will the Army Quartermaster Corps be able to carry on its vital job of food supply, but the Army will save weight, manpower and money to boot.

Technical problems and progress in

COLD STERILIZATION OF FOODS

Sgt. Merrill S. Read and H. F. Kraybill

SINCE THE discovery of X-rays in 1895, scientists have attempted to utilize the bactericidal properties of ionizing radiations. With the recent development of particle accelerators and nuclear reactors, and the increased availability of mixed fission products since World War II, the tools are now at hand for harnessing radiant energy in the processing of foods. A nation-wide food irradiation research program, spearheaded by the U. S. Army, has been under way for several years.

SERGEANT MERRILL S. READ and H. F. KRAYBILL, Ph.D., are staff members of Chemistry Division, Army Medical Nutrition Laboratory, Fitzsimons Army Hospital, Denver, Colorado. This development has far-reaching implications in military logistics. Indeed, it appears to overcome many of the problems heretofore encountered in processing and delivery of palatable food to troops in the field—problems which have been only partially resolved by such procedures as canning, freezing, and dehydration. (See "Preserving Food by Radiation," this issue.)

Unlike the commonest method of food sterilization by cooking and canning, the irradiation process, frequently referred to as "cold sterilization," results in only a slight rise in temperature, usually no more than 18°F. Through the use of this technique the food

product is essentially raw, and the alterations in flavor, color, and odor associated with heating are of a minor nature.

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Moreover, cold-sterilized food requires a minimum of storage equipment such as refrigerators, freezers and metal cans. The food may be irradiated in light-weight plastic containers, thus reducing the shipping costs to a minimum. So long as the original sealed container is not damaged, the permissible storage time of the product is extended many-fold even at room temperature and the need for special equipment for transporting and storing is largely obviated.

SEVERAL types of radiation sources are now available for sterilization of biological materials-Xrays, cathode rays (beta rays), and waste products fission (alpha, beta, and gamma rays). are machine-produced gamma rays. The ordinary X-ray machine, however, is unsuitable for large-scale processes due to the great expense necessary to produce sufficient quantities of energy. Several large research laboratories are currently working on improved X-ray machines which may soon make the use of this source economically feasible.

Cathode rays (which are actually accelerated electrons) are produced by machines such as the Van der Graff electron accelerator, the resonant transformer, and the capacitron. At best they have a penetrating power of about an inch; therefore this method is restricted to sterilization of surfaces or thin layers of food.

Use of mixed fission products is restricted primarily to the use of

gamma rays since the alpha and beta rays have such low penetrability. The penetrating power of gamma rays is so great that they may be used to sterilize the product uniformly—internally as well as on the surface. Cobalt-60, obtained by making ordinary cobalt radioactive, is commonly used as a gamma source.

Unfortunately, unlike the cathode ray generator or the X-ray machine, these gamma sources cannot be turned on or off and they require careful shielding when not in use. Furthermore, the deterioration of radioactive materials must be taken into consideration in planning facilities using fission products. In spite of these disadvantages, it appears that the use of mixed fission products, or gamma sources, may well prove to be the most practical for large-scale food sterilization.

One other source of energy, neutron bombardment, has been generally discredited for safety reasons. Due to the nature of the neutron itself, these beams often cause the foodstuff to become radioactive, thus yielding a product unsuitable for human consumption. However, investigations with gamma sources have revealed no induced radioactivity from gamma irradiation.

ALONG with the advantages already cited, there are problems arising from the irradiation process. These problems primarily concern changes in texture and palatability. For in order to sterilize some foods completely, it is necessary to use relatively high irradiation levels which may induce marked changes.

These effects, it has been found, are largely dependent on the presence of water. Irradiation of a dry product, such as powdered milk, at high irradiation levels results in only slight alterations in color, odor, or flavor; yet irradiation of normal whole milk at one-tenth these levels causes very disagreeable odor and flavor changes which render the product almost inedible. Similarly, inactivation of bacterial spores (a low moisture reproductive form of many microorganisms) requires several-fold more radiation dosage than the nonspore parent form. Immobilizing the solvent during irradiation-by freezing, for example-tends to decrease sideeffects. In addition, it has been found that by irradiating the food in an evacuated container the harmful side reactions may be minimized.

Certain "protective compounds"—materials which serve to protect the food from detrimental side-reactions during irradiation—have already been approved as additives by the Federal Food and Drug Administration. Use of these compounds in combination with other methods is expected to solve the problem of undesirable changes.

THE AMOUNT of irradiation. too, is an important factor in radiation sterilization. Irradiation dosage of tissues and foods expressed in terms of the energy which is actually absorbed—the rep (Roentgen Equivalent Physical). One rep unit may be defined as the absorption of 93 ergs of energy per gram of absorbing material. The number of rep units required for sterilization depends on the nature of the contaminating bacteria and the nature of the food. Each food, it must be remembered, represents a unique chemical system. Thus complete sterilization of liquids such as orange juice may be obtained at dosages of one million *rep* while four million *rep* are required for pureed squash.

Objectionable odor and flavor changes often become the dominant consideration in choosing the irradiation dose. For example, complete sterilization of whole milk requires one million rep, but marked changes in color, odor, and flavor result with this amount of irradiation. However, one-tenth of this dose will kill 97 percent of the organisms without noticeably changing the palatability characteristics. Similarly, 10 to 20 thousand rep inhibits sprouting in potatoes for up to eighteen months, slightly lower dosages completely sterilize trichina larvae in pork, and similar levels will also eliminate insect infestation in cereal products and other packaged rations.

IN ADDITION to the solution of the many processing problems associated with "cold sterilization," one other major area of concern remains—the nutritive properties and safety characteristics of irradiated foods. This problem is receiving increasing attention in the research programs sponsored by The Surgeon General of the Army and The Quartermaster General.

Through contract arrangements with the Office of The Surgeon General and The Quartermaster General, scientists in universities and research foundations are intensively studying the effects of radiation on individual food constituents. The effects on the nutritive properties of proteins are under investigation at the University of Illinois

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tiois The consensus of these continuing investigations is that all major food constituents undergo degradative changes when irradiated in a pure solution at one million or more *rep*. However, when irradiated in mixtures, each food constituent tends to protect the other to such an extent that the total destruction is greatly reduced.

Vitamin degradation is probably the most dramatic change following irradiation, yet the total vitamin degradation or destruction is less than occurs with conventional cooking of foods. Hence irradiated foods are nutritionally as satisfactory as comparable cooked foods, and at low irradiation levels, are considerably superior. Nevertheless, since each food represents an individual chemical system, it is important that each be investigated separately.

During the irradiation process, there is the possibility that small quantities of potentially toxic materials may be produced as byproducts. Research is being conducted by Army Medical Nutrition Laboratory at Fitzsimons Army Hospital, Denver, Colorado, the Wisconsin Alumni Research Foundation in Madison, Wisconsin, and the Armour Research Foundation in Chicago, Illinois.

As a final phase of the testing and research program, a human feeding program utilizing civilian volunteer subjects has been initiated in order to determine the effects of irradiation products on the human being. No food is fed to these volunteers until it has been declared nontoxic and nutritionally satisfactory through exhaustive animal experiments. This phase of the program is conducted at the Army Medical Nutrition Laboratory with the cooperation of the University of Colorado.

ONLY by undertaking laborious and time-consuming investigations will a sound basis for the objective and intelligent evaluation of the sterilization of food by irradiation be provided and the health of the soldier be properly safeguarded. Once this process has been accepted, it will have great importance in the realm of military supply, as well as in the more general area of world-wide distribution of adequate food supplies.

-Radiation Center Planned

PLANS FOR construction of an Army Applied Ionizing Radiation Center, capable of radiation-preservation treatment of 1,000 tons of food a month, are currently under development. The Center will have the world's first pilot-plant production-size facility for irradiating food by utilization of gamma radiation, a by-product of reactor operations.

The pilot plant facility will include an atomic reactor, to be built under Atomic Energy Commission criteria, and a linear accelerator, having a power of approximately 60 kilowatts and up to 20 million electron volts, to be constructed under Quartermaster Corps criteria. The Corps will also supervise operations.

Training AIDs

Keep your organization current with the latest training materials by referring to this section in each issue.

TRAINING LITERATURE

While the following new literature will be published shortly, units are cautioned NOT to requisition copies until receipt of automatic initial distribution or the items are listed in DA Pamphlet 310–3.

Field Artillery Missile Battalion, Corporal. This new 6-series field manual together with its classified supplement furnishes guidance to commanders of batteries, battalions, corps artillery and army artillery for the employment of Corporal battalions. The manual covers organization, command, principles of employment, reconnaissance, selection and occupation of positions, security, communications, survey, administration and logistics, gunnery, and training.

The Maneuver Enemy. This change to FM 30-101 corrects the basic manual; it calls for alteration of certain markings on Aggressor uniforms and adds material simplifying procurement of uniforms.

Engineer Field Data. FM 5-34, August 1947 has been revised to incorporate new and up-to-date material.

new and up-to-date material.

Ground Chemical Munitions. This revision of TM 3-300, March 1950 describes various types of chemical munitions available for ground combat use, their characteristics, components, and safety factors in handling.

Logarithmic and Mathematical Tables. This revision of the April 1955 edition of TM 6-230 corrects various errors in mathematical and logarithmic data contained in the 1955 edition.

Map Reproduction. TM 5-245, May 1946 has been revised to include basic information describing photolithographic method of reproducing maps, photomosaics and allied materials. It also discusses emergency expedients and operational maintenance of equipment.

TRAINING AIDS

Training Films recently approved for distribution:

Leadership. Initial distribution has been made of this series of 15 motion picture films, numbered MF 20-8637 through MF 20-8651. Ten of the films cover leadership problems for officers, 50 deal with NCO problems. They are not designed for instructional purposes but as aids to instructors and training officers by portraying handling of specific problems.

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Nike. The following films dealing with the Nike I have been released:

TF 44-2161 NIKE SAM Battalion,
Procedures and Drill
—Part I—Normal
Conditions.

TF 44-2163 NIKE I SAM Battalion
—Orientation and
Synchronization—
Part VI—Orientation of the Launcher
Rail.

TF 44–2247 NIKE I Missile Tests
—Part II—Voltage,
Receiver Sensitivity,
Power and Frequency Checks.

Full Track Vehicle Driving. Part II (TF 17-2263) of a two part series, this film entitled "Advanced Driving" illustrates driving techniques in different types of terrain and under various weather conditions. The films also illustrate problems in combat driving.

ARMY EXTENSION COURSES

The following, approved for publication by Headquarters Continental Army Command, are either new subcourses or major revisions.

General Subjects II, Subcourse 10. Ordnance School. This subcourse covers civil affairs and military government, including establishment and relationship to ordnance; mutual security programs, their organization and principles; psychological warfare capabilities and limitations; civil disturbances; casualty and casualty reporting; survival training; and physical

training, including organization of physical training program.

General Subjects III, Subcourse 11. Ordnance School. This subcourse covers battle indoctrination, foreign armies, their operation and organization; medical training and support, including preventive medicine; and military transportation to include organization and procedure.

FA Battalion Staff, Subcourse 51 (40-13). The Artillery & Guided Missile School. The organization and functions of the staff of a divisional light field artillery battalion is covered to include staff records and reports, training management, preparing and issuing operations orders and action taken after receipt of an operation order, purpose and conduct of staff inspections. Special emphasis is placed on staff administrative activities.

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y reysical Manual Central Office Fundamentals, Installation and Maintenance, Subcourse 11–13. Signal School. This subcourse lists the different types of manual central office equipment; installation of switchboards and associated equipment; repair and maintenance of equipment; tests and adjustments; central office design and layout; assembly and installation of cable racks; cable color codes; and main distributing frame (MDF).

Administration of Military Justice, Subcourse 52. The Adjutant General's School. Fundamental principles and procedures in the administration of military justice, purpose and types of military jurisdiction are covered.

Personal Affairs, Subcourse 51. The Adjutant General's School. This subcourse reviews the various personal serv-

ices and benefits included in the personal affairs program, duties of the personal affairs officer, agencies available for emergency aid to service personnel, and Social Security and survivor benefits.

Chemical Corps Procurement 1, Subcourse 80 (40–11). Chemical Corps School. This subcourse illustrates the organization for procurement; basic policies and regulations; duties and responsibilities of the contracting officer; purchase of supplies and services under Government contracts; contracting by formal advertising and by negotiation.

Chemical Corps Procurement II, Subcourse 81 (40-12). Chemical Corps School. This subcourse covers procedures for evaluating prices and ability to perform; contract administration; modification of contracts; major kinds of contracts; small purchase procedure; and procurement of repair parts.

Staff Duties of Administrative Chaplains in Service Organizations, Subcourse 36. The Chaplain School. Covers staff duties of administrative chaplains in the zone of communications including logistical commands, medical installations, ports, depots, replacement system and miscellaneous units.

Staff Duties of Administrative Chaplains in Higher Echelons, Subcourse 38. The Chaplain School. Describes staff duties of chaplains at theater army headquarters, Continental Army Command; also covers organization and function of Office of the Chief of Chaplains, Chaplain Board and Chaplain School.

-Your Date With History

A CALENDAR OF ARMY ANNIVERSARIES

- 1 Oct 1940: Armor School established as Armored Force School.
- 7 Oct 1918: The "Lost Battalion," 575 men of the 77th Division, relieved by the 307th Regiment in World War I action.
- 19 Oct 1781: Cornwallis surrendered his command to General Washington at Yorktown.
- 20 Oct 1944: United States forces under General MacArthur landed on east coast of Leyte Island, marking historic return to the Philippines.



PARAGRAPHS

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The Pentagon and the Field

In a move to simplify command and organization of United States forces in the Pacific-Far East areas, the responsibilities of the Commander-in-Chief, Pacific, and the Commander-in-Chief, Far East Command will be consolidated under the Commander-in-Chief, Pacific, with headquarters in Hawaii, effective 1 July 1957.

The United Nations Command will be retained as a separate major command but its headquarters, presently in Tokyo, will be relocated in Korea. United States support of United Nations forces in Korea will become the responsibility of the Commander-in-Chief, Pacific.

In accordance with the Japanese Security Treaty and in cooperation with Japan's Self Defense Forces, a headquarters for U. S. forces in Japan will be maintained in Tokyo under the Commander-in-Chief, Pacific.

In other major command changes, the U. S. Northeast Command was disestablished on 1 September 1956, when air defense responsibility for the Northeast was assigned to Commander-in-Chief, Continental Air Defense Command. Air defense responsibility for Alaska is now assigned to the Commander-in-Chief, Continental Air Defense Command, while protection of Alaska sea communications is under Commander-in-Chief, Pacific,

To facilitate administration of Mutual Defense Assistance programs in Latin America and to represent United States military interests there, the Commander-in-Chief Caribbean area of responsibility has been redefined as Central America (less Mexico) and South America.



The term "Strategic Reserve", rather than "General Reserve" will hereafter be used in referring to deployable active Army units in the United States and Hawaii. This change in terminology is intended to provide a name more accurately applying to the reserve. The Strategic Reserve is defined as "That part of the Army normally located in the Continental United States and Hawaii which is trained, equipped, and maintained for employment at national level in accordance with current Army plans or approved emergency deployment schedules." It is composed of active Army units, and does not include the Army Reserve or the National Guard. Army Antiaircraft Command also is not included.



A new and simpler method of jellying gasoline for use in firebombs, flamethrowers, and other flame weapons, has been developed by the Army Chemical Corps. The new method substitutes a readily available domestic petroleum product for an ingredient formerly imported.

Heretofore an aluminum compound and three fatty acids—oleic acid, napthenic acid, and coconut fatty acid (mostly imported)—were compounded to produce an aluminum soap powder which would jell gasoline. The new and simpler method involves the use of a single fatty acid.

The new jelling agent is also a soap. Its raw materials are derived from petroleum, and are converted into an aluminum soap of iso-octanoic acid which, when mixed with gasoline, yields a jelly. The new compound was developed by the Chemical Corps working with industry.



Former members of the 101st Airborne Division who served with the unit during combat operations in World War II may apply for reassignment to the Division which is being reorganized at full strength. Details are contained in Department of Army Circular 614-6.

Effective 1 September, black replaced russet and tan as the approved color for Army dress footwear. According to Department of the Army Circular 670–5, the wearing of russet colored oxfords and tan socks will not be authorized for wear after that date by male Army personnel, including National Guard and Army Reserve personnel participating in active duty for training.



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Educational television is being adapted for use with USAFI courses. Under a program sponsored by the Department of Defense Office of Armed Forces Information and Education, kinescopes of lectures by outstanding civilian educators will be integrated with the most popular courses offered by the United States Armed Forces Institute.

Films now in preparation include high school courses in Beginning Algebra and Practical English (produced by WQED, Pittsburgh) and college level courses in Psychology and Chemistry (produced by Pennsylvania State University).



Beginning 1 January 1957, all military services will begin using the same forms for requesting, shipping, billing, and receiving of materiel, the Department of Defense has announced. The single series of standardized forms will eliminate scores of diverse forms currently in use, and at the same time will contribute to successful operation of the recently established Single Manager System for common-use items of food, clothing, medical supplies.



Capable of performing a wide range of military missions, a remotely controlled helicopter has been developed by the Army and Navy, working with research engineers of Kaman Aircraft Corporation, Bloomfield, Connecticut. Three machines, under a contract sponsored jointly, will be used by the services for evaluation purposes. A number of successful remotecontrol flights have been made with flying TV cameras. The machine is declared capable of many missions ranging from laying communications wires over rough

terrain to dropping explosives on a line through a mine field.



All Army Ordnance big missiles so far announced—Nike, Corporal, Honest John, and Redstone—are transportable by road, rail, ship or air.



In a move to adjust strength in overstaffed skills to present Army needs, enlisted personnel in the first three pay grades will carry an additional MOS on return from overseas. Under a change to AR 612–50, the second MOS will be one of the job specialties previously held and recorded on the individual's Form 20 in which he is best qualified. Reassignment of overseas returnees in the ZI and U. S. possessions may be made in this awarded MOS if primary MOS vacancies do not exist.



Frozen food cabinets will be supplied to Army messes by the Army Quartermaster Corps, for storage of frozen foods. Messes now are equipped with electric refrigerators suitable for chilled types of food, but not for storage of frozen foods.



An expedited requisitioning procedure, identified by the code name "Blue Streak", has been established by the Army Signal Corps to expedite delivery of supplies needed for tactical defense of the United States.



Terramycin, given late in the incubation period, will prevent Q fever—a pneumonia-like malady common throughout most of the temperate and tropic areas of the world—according to results obtained in experiments with a group of volunteers at the Walter Reed Army Medical Center, Washington, D. C. Latest research indicates that the infection is spread by inhalation of dust contaminated by diseased cattle, sheep, goats, dogs and monkeys, domestic fowl, and pigeons.

Army Ordnance has about 3,500 guided missile scientists, engineers and other specialists at work developing and proofing guided missiles.



A new "stop-gap" upper atmosphere experimental network that takes in the area from where standard weather balloons stop and rockets start, has been inaugurated by the Signal Corps Engineering Laboratories, Fort Monmouth, New Jersey.

Experimental balloons weighing less than two pounds but carrying almost five pounds of weather-gathering equipment, now are probing areas more than 20 miles aloft. They send back hitherto unobtainable data on atmospheric pressures, temperatures and humidity through a small radio transmitter.

Official Notes

LOGISTIC FUNCTIONS. AR 701–5 establish general policies and prescribe procedures for announcement and implementation of assignment of responsibilities for the principal logistic functions within the Department of the Army.

PAY AND ALLOWANCES. AR 35–2005 define and delineate in detail the handling of substantiating documents used in payment of members of the Army in the active military service.

ARMY RESERVE SCHOOLS. AR 140–353 provide information on establishing U. S. Army Reserve schools in localities having a potential Reserve population density that can sustain an efficient, justifiable and economical school. Where such schools cannot be established, reservists are to be encouraged to develop branch and staff proficiency by participating in extension courses, training projects, attachment to troop units.

APPOINTMENT AND REDUCTION. AR 624–200 provide for permanent and temporary appointments of enlisted personnel and also for reductions in grade. The regulations apply to all enlisted personnel in active Federal service except members of reserve components ordered to active duty for training.

SEPARATION PROCEDURES. AR 635–5 establish uniform administrative procedures and separation forms to be used in connection with the relief from active duty, or complete separation from the military service, of commissioned officers, warrant officers, enlisted personnel.

RESERVE SCREENING. AR 135–133 provide standards and instructions for screening the Ready Reserve and for reporting to Selective Service transfers to and from the Standby Reserve.

MEMORIALIZATION BOARD. AR 15–190 set forth composition and functions of the Department of the Army Memorialization Board which formulates and executes policies relating to memorialization of individuals who have distinguished themselves in the military service of the United States.

RESERVE OFFICER PROCURE-MENT. AR 140-100 provide a basis for the systematic procurement of Reserve commissioned officers for service in the Army Reserve, and establish the requirements and procedures for appointment.

EQUIPMENT REDUCTION PROGRAM. AR 700–11 prescribe responsibilities and procedures for reducing the number and types of items procured, distributed, and maintained by the Army Logistic System.

INCENTIVE AWARDS. AR 672–301 describe types of awards authorized in recognition of contributions by civilian employees.

MEDICAL CARE. AR 40-101 establish general policies pertaining to the provision of medical care, prescribe manner and conditions under which authorized personnel are provided such care, and contain general information concerning treatment of patients.

Mechanical Mule For Off-Road Mobility

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the iannorare, ernPROVIDING a welcome lift for the combat soldier, the Army's new "mechanical mule" has been placed in production. First of these lightweight tactical vehicles soon will be serving with the recently activated 101st Airborne Division.

A four-cylinder version of the famed four-footed animal that took Army units and materiel over the roughest sort of terrain, the vehicle is designed for off-road mobility in forward combat areas. Weighing only 750 pounds, and capable of carrying more than its own weight, it can be transported by truck, plane or helicopter and can be dropped by parachute.

The new tactical vehicle—first of its type to be added to the Army's mobile family since development of the jeep—is being manufactured by Willys Motors, Inc., the firm which also made the jeep. A contract for approximately \$3,500,000 has been let for production, half a million of which is for vehicle engineering.

CAPABLE of moving heavy loads from one mile up to 25 miles an hour, the vehicle can climb a 72 percent slope. It is 100 inches long, 46 inches wide, with a low silhouette of 27 inches.

Designed primarily as a cargo carrier for weapons, ammunition or other materiel that otherwise would have to be hand-carried over rough terrain, the "mule" also can be used as a mount for the 106mm. recoilless rifle.

The new vehicle was designed under supervision of Army Ordnance engineers at Detroit Arsenal. First deliveries are scheduled within a year. Previously, five experimental models had been built and put through rigid tests.

(For views of Mechanical Mule traversing terrain obstacles, see back cover)

